"Method and Apparatus for Copy
Protection Detection in a Video Signal"
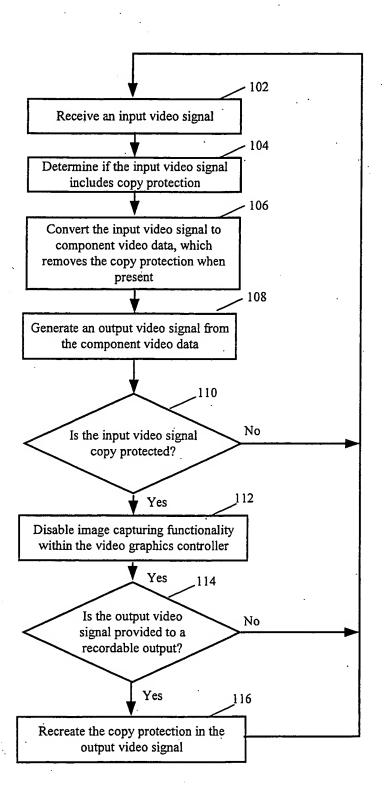Inventor: Antonio Rinaldi
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```
                          ┌─ 102
        ┌──────────────────────────────────┐
        │    Receive an input video signal  │
        └──────────────────────────────────┘
                          ┌─ 104
        ┌──────────────────────────────────┐
        │  Determine if the input video signal │
        │        includes copy protection    │
        └──────────────────────────────────┘
                          ┌─ 106
        ┌──────────────────────────────────┐
        │   Convert the input video signal to │
        │   component video data, which      │
        │   removes the copy protection when │
        │             present                │
        └──────────────────────────────────┘
                          ┌─ 108
        ┌──────────────────────────────────┐
        │  Generate an output video signal from │
        │      the component video data      │
        └──────────────────────────────────┘
                          ┌─110
              Is the input video signal        No
                 copy protected?
                          │ Yes          ┌112
        ┌──────────────────────────────────┐
        │  Disable image capturing functionality │
        │   within the video graphics controller │
        └──────────────────────────────────┘
                          │ Yes    ┌114
                 Is the output video            No
                 signal provided to a
                 recordable output?
                          │ Yes          ┌116
        ┌──────────────────────────────────┐
        │   Recreate the copy protection in the │
        │         output video signal        │
        └──────────────────────────────────┘
```

Figure 1.

"Method and Apparatus for Copy
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202
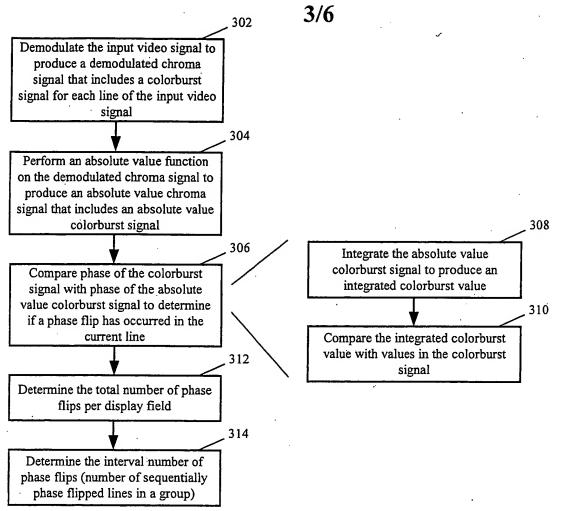Quantize the input video signal to
produce a digital video signal
including a stream of values

204
Does a value in the
digital video signal exceed a
first threshold? — No →

206
Next value

Yes

208
Increment an accumulator value

210
End of field? — No

Yes

212
Does the accumulator value
exceed a second threshold? — No →

214
Decrement the
count value

Yes

216
Increment the count value

218
Has the count value reached
a high threshold? — Yes →

220
Indicate pulse-type copy
protection is included in
the input video signal

No

224
Has the count value reached
a low threshold? — Yes →

226
Indicate pulse-type copy
protection is not included
in the input video signal

No

222
Next field

Figure 2.

"Method and Apparatus for Copy
Protection Detection in a Video Signal"
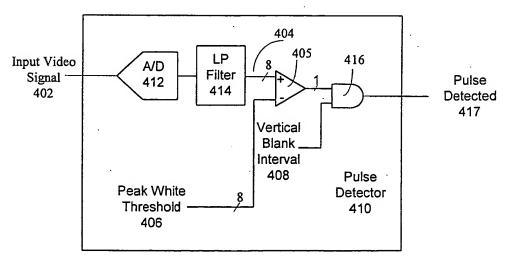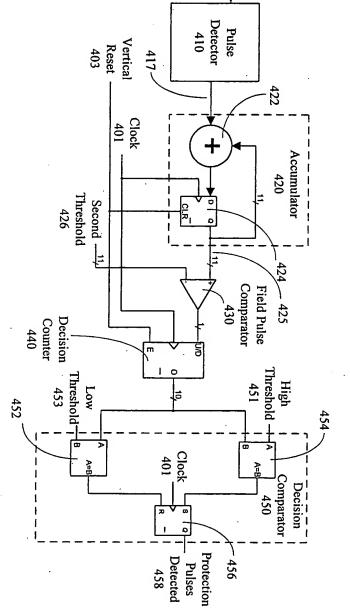Inventor: Antonio Rinaldi
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302
Demodulate the input video signal to produce a demodulated chroma signal that includes a colorburst signal for each line of the input video signal

304
Perform an absolute value function on the demodulated chroma signal to produce an absolute value chroma signal that includes an absolute value colorburst signal

306
Compare phase of the colorburst signal with phase of the absolute value colorburst signal to determine if a phase flip has occurred in the current line

308
Integrate the absolute value colorburst signal to produce an integrated colorburst value

310
Compare the integrated colorburst value with values in the colorburst signal

312
Determine the total number of phase flips per display field

314
Determine the interval number of phase flips (number of sequentially phase flipped lines in a group)

Figure 3.

Input Video
Signal
402

A/D
412

LP
Filter
414

404

8

405

+

−

1

416

Pulse
Detected
417

Vertical
Blank
Interval
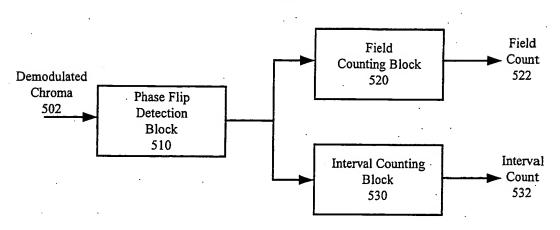408

Peak White
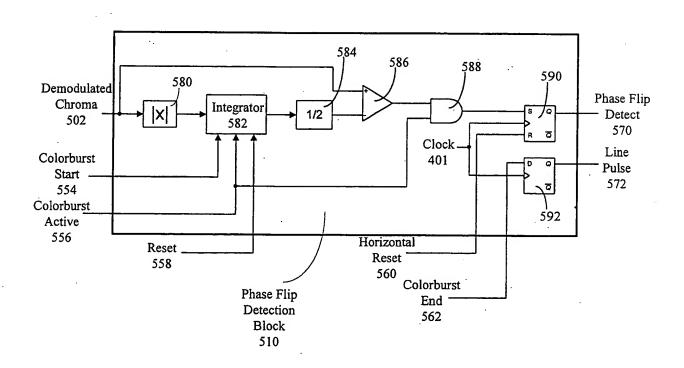Threshold
406

8

Pulse
Detector
410

Figure 5.

"Method and Apparatus for Copy
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Figure 4.
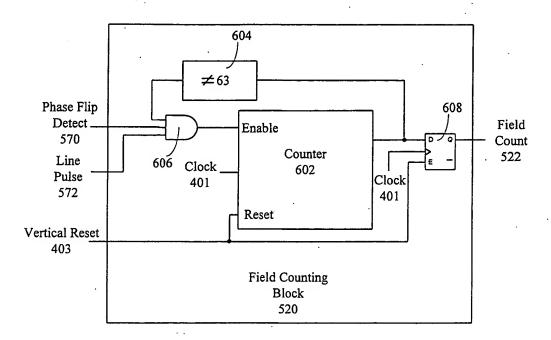
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Demodulated
Chroma
502

Phase Flip
Detection
Block
510

Field
Counting Block
520

Field
Count
522

Interval Counting
Block
530

Interval
Count
532

Figure 6.

Demodulated
Chroma
502

|X|
580

Integrator
582

1/2
584

586

588

Clock
401

S Q
R Q̄
590

Phase Flip
Detect
570

D Q
Q̄
592

Line
Pulse
572

Colorburst
Start
554

Colorburst
Active
556

Reset
558

Horizontal
Reset
560

Colorburst
End
562

Phase Flip
Detection
Block
510

Figure 7.

"Method and Apparatus for Copy
Protection Detection in a Video Signal"
Inventor: Antonio Rinaldi
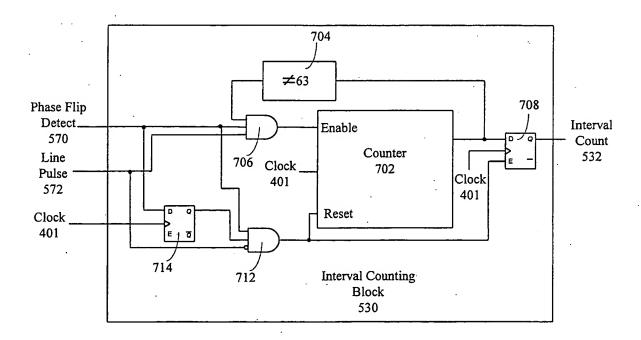Docket No.: 00100.99.0531

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Figure 8.

Figure 9.